CLAIMS:

1. A monitor to monitor the position of the path of motion of a reciprocating piston (1) relative to the surrounding cylinder (2), comprising a sensor (4), which communicates with an evaluation unit and which is fixedly arranged in the region of the dead center of the piston movement relative to the cylinder, and an indicator unit (6) arranged in the region of the face (11) of the piston (1), whereby the indicator unit (6) is disposed in the region of the dead center of the piston movement in a lateral space (a) that can be evaluated by the evaluation unit to determine the relative position of the path of motion of the piston (1) and which lateral space (a) can be detected by the sensor (4), wherein the sensor (4) is arranged in a recessed position relative to the inner surface of the cylinder (2) whereby the sensor is sealed toward the cylinder chamber (9) by means of a cover (8), and that the indicator unit (6) is designed as an anomaly (10, 27) being non-sensitive to contamination by deposits.

2. A monitor according to claim 1, wherein there are provided a plurality of cooperating indicator units vertically spaced apart from the piston axis (25) and/or separate cooperating indicator elements of the indicator unit (6) vertically spaced apart from the piston axis (25) while being separate from the

sensor element (16) which can be interrogated by the evaluation unit.

3. A monitor according to claim 2, wherein the sensor elements (16, 16') are designed to operate according to different measuring principals.

4. A monitor according to claim 2, wherein the indicator unit (6) is designed as a spatial anomaly (10) in the region of the face (11) of the piston (1) whereby the lateral distance (a) to at least two sensor elements (16) - which are preferably designed as eddy current sensors – can be evaluated by the evaluation unit to determine the spatial position of the dead center of the path of motion of the piston (1).

5. A monitor according to claim 2, wherein the indicator unit (6) is provided with at least one inserted magnetic element (27), preferably by forming a smooth face (11) in the region of the piston (1) or piston rod (5), whereby at least one of the sensor elements (16, 16') is designed as a magnetic field sensor, which converts the declination of the detected magnetic field lines into a measurement signal.

6. A monitor according to claim 1, wherein the sensor element (s) (16, 16') is/are arranged in an adapter inserted with a seal in the cylinder head (7).

7. A monitor according to claim 1, wherein there is arranged in the region of the face (11) of the piston (1) or piston rod

(5) at least one measuring block (13), preferably separately mounted, serving as a spatially projecting indicator unit (6), which extends into at least one measuring cartridge (15) and which is sealed toward the outside and inserted into the cylinder head (7) as adapter, whereby at least one sensor element (16) is arranged in the measuring cartridge (15) that is oriented laterally toward the measuring block (13) in the region of the dead center of the path of motion of the piston (1).

8. A monitor according to claim 7, wherein the measuring block (13) is designed in the form of a cylinder (26) having generating elements and lying parallel to the piston axis (25) in the an area which lies opposite the sensor element(s) (16) in the region of dead center of the path of motion of the piston (1), whereby the sensor element(s) (16) detect essentially the radial distance in a standard plane to the piston axis (25).

9. A monitor according to claim 7, wherein the measuring block (13) is provided with a flat surface facing the sensor element (16) in the region of the dead center of the path of motion of the piston (1) whereby said surface is essentially perpendicular to the connecting line leading to the surface oriented toward the sensor element (16).

10. A monitor according to claim 7, wherein the measuring cartridge (15) is provided with at least one pickup element (17), which is open toward the cylinder chamber (9) and sealed toward the cylinder chamber (9), for the detection of the sensor element(s) (16) whereby the pickup element (17) is designed to be as thin as a diaphragm and made of a material that does not influence - or influences only to a small degree - the sensitivity of the sensor, and whereby the pickup element (17) is disposed respectively in the area between the sensor element (16) and the inserted measuring block (13).

11. A monitor according to claim 10, whereby in the design of the sensor element (16) as eddy current sensor, the pickup element (17) or at least its diaphragm-like section (8) is made of synthetic material, preferably fiber-reinforced.

12. A monitor according to claim 10, wherein one or each sensor element (16) in the pickup element (17) is arranged essentially without having a hollow space whereby the pickup element (17) is supported from the inside against the cylinder pressure.

13. A monitor according to claim 1, wherein the lateral distance (a) between the sensor (4) and the indicator unit (6), which is detected with the inventive control monitor in the region of the dead center of the path of motion of the piston

(1), serves directly as wear indicator to monitor the wear of the rider rings (24) arranged on the piston (1).